MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2015/2016

EBI3016 – BIOMATERIALS

(BE Groups)

7 OCTOBER 2015
2.30 p.m - 4.30 p.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 3 pages with 4 Questions only.
2. Answer all questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please write all your answers in the Answer Booklet provided.

QUESTION 1

a. Discuss the mechanical properties that govern the material selection and design of the keel in artificial limbs.

[10marks]

b. Briefly classify types of biomaterials based on the properties.

[12 marks]

c. Biocompatibility is related to the behavior of biomaterials in various environments under various chemical and physical conditions. Define the term biocompatibility.

[3marks]

QUESTION 2

a. Discuss the important criteria needed to be considered when investigating the selection of the polymer for biomedical applications.

[10marks]

b. Explain the special considerations or cares needed to be taken in the conventional processing for biodegradable polymer such as compression or injection molding.

[4marks]

c. Explain the difference in mechanism of solid-state sintering and liquid-phase sintering which joins the grains inside a ceramic. Give example in your explanation.

[11marks]

Continued .....

QUESTION 3

a. Explain the event taken place in acute inflammation. [9marks]

b. Discuss about foreign body reaction in biomedical application [7marks]

c. Explain 3 different environmental factors affecting polymer degradation. [9 marks]

QUESTION 4

a One common biomaterial application is the construction of an arterial graft, a device that replaces a section of an artery. An artery is a flexible blood vessel that can withstand varying pressures and regulates the flow of blood. Arteries also provide a smooth interior surface to inhibit blood clotting within the vessel.

i. Discuss advantages and disadvantages of three major types of biomaterials. Do your selection.

[13marks]

ii. Explain specific material characteristics that need to be considered for the arterial graft application.

[8marks]

b. Define the term polymer. Give an example of a polymer and describe its use in a biomedical prosthesis.

[4marks]

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